REMARKS

In the Office Action, the Examiner reviewed claims 1-11 of the above-identified US Patent Application, with the result that the Abstract was objected to and all of the claims were rejected. In the present response, Applicants have amended the specification and claims as set forth above. More particularly:

A substitute Abstract has been presented that starts on a separate page and more closely describes the invention of the pending claims.

Independent claims 1 and 11 have been amended to require that the device has a metal wall in which are formed at least one corrugated convolution that define a corrugated outside surface and a corrugated inside surface of the device, as shown in Figure 1.[1]

Applicants believe that the above amendments do not present new matter. Favorable reconsideration and allowance of claims 1-11 are respectfully requested in view of the above amendments and the following remarks.

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[1] According to MPEP §2163 II.A.3(a), "drawings alone may provide a 'written description' of an invention as required by [35 USC §112, first paragraph]," and "[i]n those instances where a visual representation can flesh out words, drawings may be used in the same manner and with the same limitations as the specification." (Citations omitted).

Objection to the Specification

Applicants believe that the basis for the Examiner's objection to the Abstract is addressed by the attached substitute Abstract of the Disclosure. As such, Applicants respectfully request withdrawal of this objection.

Claim Rejections under 35 USC §102

The Examiner rejected independent claims 1 and 11 and dependent claims 2-10 (which depend from claim 1) as being anticipated by U.S. Patent No. 3,561,492 to Kauder et al. (Kauder), U.S. Patent No. 4,246,937 to Müller, U.S. Patent No. 5,803,132 to Lupke, and U.S. Patent No. 6,006,788 to Jung et al. (Jung), and rejected independent claims 1 and 11 and dependent claims 2, 3, and 5-10 as being anticipated by U.S. Patent No. 6,631,741 to Katayama et al. (Katayama). Applicants respectfully request reconsideration of these rejections in view of the amendments presented above as well as the following comments.

From the Office Action it is unclear as to how the limitations recited in the rejected claims are specifically met by Kauder, Müller, Lupke, and Jung.[2]

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[2] See MPEP 706.02(l) regarding 35 USC §102 rejections: "Note that the particular part of the reference relied upon to support the rejection should be identified."

Applicants have reviewed these references in an attempt to discern the basis for the rejections, and in doing so provide the following arguments. If, in response to Applicants' present response, the Examiner maintains these rejections and explains how the limitations of the claims are met by Kauder, Müller, Lupke, and Jung as required by MPEP 706.07[3] and 707.07(f)[4], Applicants kindly and respectfully request that such a second rejection not be made final.

Applicants' claimed invention is a flexible metal tubular device that, as evidenced by Examples 1 through 7 in Applicants' specification, exhibits greatly increased flexibility as a result of its claimed corrugated form.

Kauder discloses a conduit with a corrugated outer sleeve 1 and a separate inner pipe or tube 3 that is also corrugated. Because the outer and inner surfaces of Kauder's conduit are defined by the outer sleeve 1 and the inner tube 3, respectively, Kauder does not meet the limitation in Applicants'

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[3] "[T]he final rejection . . . should include a rebuttal of any arguments raised in the applicant's reply."

[4] "Where the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it."

independent claims 1 and 11 for a metal wall in which are formed corrugated convolutions that define both the corrugated outside surface and corrugated inside surface of a tubular device.

Furthermore, Kauder's inner tube 3 has inward folds 4 and outward ridges 5, wherein the folds 4 have a curvature that is larger than the ridges 5 - which is the very opposite of that recited in Applicants' independent claims 1 and 11.

In view of the above, Applicants believe that Kauder does not anticipate independent claims 1 or 11 nor any of the dependent claims, and therefore respectfully request withdrawal of the rejection under 35 USC §102 based on Kauder.

Müller discloses a tube 2 that surrounds and protects a cable 1. The tube 2 is corrugated to define "thread-like windings" on its inner surface 2a, while its outer surface 2b is configured to enable a reinforcement ring 7 to be threaded onto it (column 1, line 68-column 2, line; column 2, line 59-column 3, line 8). As such, Müller's tube 2 is necessarily helical. In contrast, independent claims 1 and 11 require convolutions that are "oriented perpendicular to a longitudinal axis of the device," in other words, are not helical.

The helical configuration of Müller's tube 2 allows the tube 2 to twist when subject to bending. This is an undesired property in many applications, such as those described in Applicants' specification. This undesired twisting an lead to cracking caused by metal fatigue. Müller does not contain any teaching with respect to this concern or how the flexibility of the tube 2 can be improved to avoid fatigue failure.

In view of the above, Applicants believe that Müller does not anticipate independent claims 1 or 11 nor any of the dependent claims, and therefore respectfully request withdrawal of the rejection under 35 USC §102 based on Müller.

Lupke discloses a double wall plastic pipe 21 having a ribbed (corrugated) outer wall 23 and a flat inner wall 27. Because the outer and inner surfaces of Lupke's pipe 21 are defined by the outer wall 23 and the flat inner wall 27, respectively, Lupke does not meet the limitation in Applicants' independent claims 1 and 11 for a metal wall in which are formed one or more corrugated convolutions that define both a corrugated outside surface and a corrugated inside surface of a tubular device.

Also, the double wall pipe 21 is made by an extrusion process, which

inherently dictates that the corrugations of the outer wall 23 must be helical. In contrast, independent claims 1 and 11 require convolutions that are "oriented perpendicular to a longitudinal axis of the device," in other words, are not helical. whereas amended claim 1 involves that the "convolutions are placed perpendicular to a longitudinal axis of the device", i.e. being nonhelical.

Finally, Lupke's double wall construction provides considerable stiffness to the pipe 21, which would discourage one skilled in the art person from relying on Lupke to gain useful information with respect to obtaining a flexible tubular device as required by independent claims 1 and 11.

In view of the above, Applicants believe that Lupke does not anticipate independent claims 1 or 11 nor any of the dependent claims, and therefore respectfully request withdrawal of the rejection under 35 USC §102 based on Lupke.

Jung discloses a conduit that includes a metal tube 1 having helical undulations (corrugations) 8, contrary to independent claims 1 and 11 requirement for convolutions that are "oriented perpendicular to a longitudinal axis of the device," in other words, are not helical.

In addition, Jung's tube 1 only defines an inner surface of the conduit -

the outer surface of the conduit is defined by a sleeve 7 that is not corrugated. Therefore, Jung does not meet the limitation in Applicants' independent claims 1 and 11 for a metal wall in which are formed one or more corrugated convolutions that define both the corrugated outside surface and corrugated inside surface of a tubular device.

Finally, the shape of the corrugations 8 on Jung's tube 1 is shown in Figure 4 as a combination of circular sections with constant smaller radii r and larger circular sections with constant radii R, providing two sets of constant curvatures, i.e., 1/r and 1/R. As such, the shape of the corrugation on Jung's tube 1 is contrary to that claimed for Applicants' tubular device, in which the outside surface is said to have a "non-constant curvature." Applicants' testing reported in their specification shows that constant curvature does not provide full use of the actual capability of a tube material. This shortcoming of prior art such as Jung is overcome in part by Applicants' claimed feature of an outside surface having a "non-constant curvature."

In view of the above, Applicants believe that Jung does not anticipate independent claims 1 or 11 nor any of the dependent claims, and therefore respectfully request withdrawal of the rejection under 35 USC §102 based on Jung.

Katayama discloses a multilayered metal-composite corrugated hose having a ribbed (corrugated) inner metal layer A and an outer resin layer B. Because the outer and inner surfaces of Katayama's hose are defined by the resin layer B and the metal layer A, respectively, Katayama does not meet the limitation in Applicants' independent claims 1 and 11 for a metal wall in which are formed one or more corrugated convolutions that define both a corrugated outside surface and a corrugated inside surface of a tubular device.

Furthermore, the shape of the corrugations on Katayama's hose appear to be a combination of smaller and larger circular sections, each with constant radii and therefore providing two sets of constant curvatures. As such, the shape of the corrugation on Katayama's hose is contrary to that claimed for Applicants' tubular device, in which the outside surface is said to have a "non-constant curvature."

In view of the above, Applicants believe that Katayama does not anticipate independent claims 1 or 11 nor any of the dependent claims, and therefore respectfully request withdrawal of the rejection under 35 USC §102 based on Katayama.

Claim Rejection under 35 USC §103

The Examiner rejected dependent claim 4 (which depends from claim 1) as being unpatentable over Katayama. In view of Applicants' remarks above under the §102 rejection based on Katayama, Applicants believe that one skilled in the art would be required to modify the teachings of Katayama to arrive at Applicants' claimed tubular device, in terms of the pitch-to-height ratio as well as the other previously noted differences. However,

> The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the *prior art* suggested the desirability of the combination. (Emphasis added.)

MPEP 2143.01, citing *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).

As Katayama is lacking in any motivation to modify Katayama's hose to resemble Applicants' claimed tubular device, Applicants respectfully request withdrawal of the rejection under 35 USC §103 based on Katayama.

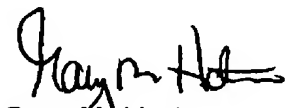
Closing

In view of the above, Applicants believe that the claims define

patentable novelty over all the references, alone or in combination, of record. It is therefore respectfully requested that this patent application be given favorable reconsideration.

Should the Examiner have any questions with respect to any matter now of record, Applicants' representative may be reached at (219) 462-4999.

Respectfully submitted,

By 
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Attachment: Abstract